Adapting Local Agency Pavement Management Procedures To Develop a Simplified System for Use by Smaller Cities in Washington

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When Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, many larger local agencies in the state of Washington had already implemented a pavement management system (PMS). Larger cities and counties had adopted PMS procedures after the University of Washington, working with the Washington State Department of Transportation (WSDOT), modified the Washington State PMS in the late 1980s to accommodate local agencies. However, very few smaller cities in Washington state have adopted PMS procedures. Because ISTEA requires that all roads eligible for federal aid must be on a PMS, smaller cities that have even only a few segments or sections of Federal-aid roadways are required to have a PMS. In response to that need, the TransAid Service Center of WSDOT, working with a number of smaller cities, has developed a manual that is based on the computerized systems in the state yet can be filled out with pencil and paper. The simplified system should enable metropolitan planning organizations to use the manual system in comparing its results with those of any of the other existing computerized systems. It is WSDOT's intention that even if the management system requirements are suspended, as currently proposed, the simplified system will still be sent out to smaller cities. These agencies will be encouraged to develop projects for transportation improvement plans from the results derived from the simplified systems.

Pavement management dates to the 1960s in the state of Washington. The first formalized, automated pavement management system (PMS) in Washington was a visually based system implemented by the Washington State Department of Transportation (WSDOT) in response to legislation passed in the 1960s. Known as the Priority Programming Law, Chapter 47.05 of the Revised Code of Washington, this legislation mandated that WSDOT priority rank proposed state highway construction projects according to defined needs.

In developing the Priority Programming Law, the legislature selected the structural ability of a road to carry loads as the primary measure of pavement needs. In 1993 the legislature amended the Priority Programming Law to reference life-cycle costing in addition to need.

In the late 1960s, WSDOT developed a procedure for conducting a periodic visual survey on the entire state highway network and recording pavement surface defects. WSDOT selected defects that would provide a clear indication of structural adequacy. Numeric values representing various levels of severity were established for these defects and used to define an overall condition index. The sum of the defect numeric values was equivalent to the approximate percentage of life remaining in the pavement and came to be known as the pavement condition rating (PCR).

Using the most recent PCR values associated with each predefined highway segment, the system was designed to produce a list of prioritized projects. Projects in the worst condition were ranked first. Although it was not called a pavement management system at the time, this was Washington's first PMS (*1*).

In the late 1970s, WSDOT began to develop and implement the Washington State Pavement Management System (WSPMS). WSDOT has applied the WSPMS over the entire state highway network since 1983. The WSPMS is based on developing project-specific performance curves that are used to predict pavement condition. The diverse rates of deterioration among various projects are addressed through the use of these project-specific performance curves. This has provided a reasonable, reliable method for establishing future multiple-year programs (*2*).

After several years of experience in pavement management, WSDOT has been able to target the time of lowest life-cycle cost for most rehabilitation projects. Although this process is based on very simplistic models, it does offer a way to minimize rehabilitation costs while preserving the structure of the highway network (*2*).

Subsequent to the development of the WSPMS, the state's cities and counties developed their own versions of PMS, based on the WSPMS. Such work was performed in the 1980s under a contract with the University of Washington after a study showed the viability of using the WSPMS for local agencies (*3*).

Today the three main PMSs being used by local agencies are based on the work done by the University of Washington. Most of the 39 counties in the state are using a PMS developed through the County Road Administration Board (CRAB). CRAB modified the source code from the University of Washington system and integrated its PMS into the County Road Information System. Larger cities currently use the other two versions. One is supported by a consultant, and the other is supported by the TransAid Service Center of WSDOT. Both of these PMSs are also modifications of the University of Washington source code.

When Congress passed the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, mandating that all Federal-aid roads must be managed by a PMS, many local agencies in Washington State already had pavement management procedures in place. However, most smaller cities that had only a few miles of Federal-aid roads had not implemented pavement management pro-

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cedures. Thus, the TransAid Service Center, working with other departments of WSDOT, began to investigate how to develop a "simplified system" that did not deviate from the principal requirements of other systems used in the state.

REASON FOR SIMPLIFIED SYSTEM IN WASHINGTON

There are more than 270 cities in Washington. Of these, 174 are considered to be rural cities, and 97 are considered to be urban. In 1995 WSDOT conducted an analysis to determine how many miles of Federal-aid roadways each local agency was responsible for maintaining. Of the 174 rural cities, 172—or 99 percent—had fewer than 5 mi of Federal-aid roadways. In urban areas, only 17 had fewer than 5 mi of Federal-aid roadways. In total, 70 percent of all cities in the state had fewer than 5 mi of Federal-aid roadways. Of this group, 84 percent had fewer than 2 mi of Federal-aid roadways. Before ISTEA was passed, none of the communities with fewer than 5 mi of Federal-aid roadways had implemented a formalized PMS. Therefore, in order for the PMS to be accepted, it had to be perceived as neither cumbersome nor complicated by those responsible for implementing it.

The TransAid Service Center, which is responsible for working with smaller cities, planned not only to develop a simplified system for smaller cities, but to fully support it. WSDOT was aware that training and continued support are important to PMS development. This is especially true for smaller agencies, in which the individuals implementing the PMS are responsible for many other maintenance and engineering activities (*4*).

DEVELOPMENT OF SIMPLIFIED SYSTEM

From the beginning of the development of the simplified system, WSDOT intended to provide a manual system to cities. WSDOT believed that if a city wanted to use a computer system, there were already systems readily available. Initially, the simplified system was envisioned to be a 10-group matrix similar to that in Table 1.

With the *Pavement Surface Condition Rating Manual* (*5*) as a guide, a series of distress types with respective deduct values was developed to equal all of the corresponding PCR groups given in Table 1. Using this method, a city would survey its streets for distress types and calculate the PCR back in the office. However, there were some problems with this method. First, the scores at which cities arrived could be off by as many as 18 points from an actual survey. PCR ranges were fine, but cities wanted more precision in their surveys than just deduct values associated with certain ranges. Second, there was no relationship or correction for streets on which more than one distress type were found. This approach, though simple, was not close enough to the methods of other local agencies in Washington that use computerized systems. Of equal importance, it would have also been difficult for metropolitan planning organizations (MPOs) to compare the project of a smaller city using this system with a project of a larger agency using any of the other PMSs in developing its transportation improvement plan (TIP).

After learning from the shortfalls of this first attempt at a simplified system, WSDOT made a series of modifications. Working with several local agencies, WSDOT developed an inventory form from one used by a larger city in its data collection. The key to developing this form was to allow the local agency to define its inventory, but to also collect distress information on the same sheet. This enabled the city to retain only one form for two procedures.

TABLE 1 Distress Types and Corresponding PCR Groups

Pavement Condition Rating	Distress Types*
90 - 100	Deducts = to this grouping
80 - 89	Deducts = to this grouping
70 - 79	Deducts = to this grouping
60 - 69	Deducts = to this grouping
50 - 59	Deducts = to this grouping
40 - 49	Deducts = to this grouping
30 - 39	Deducts = to this grouping
20 - 29	Deducts = to this grouping
10 - 19	Deducts = to this grouping
0 - 9	Deducts = to this grouping

* A combination of distress types with associated deducts = to PCR range

Besides reducing the number of inventory items that a smaller city needed to collect, the number of distresses to be collected was also reduced. The *Pavement Surface Condition Rating Manual* (*5*) was used to determine which distresses were the most important to smaller cities. In particular, it was important to identify distress types that would determine pavement maintenance decisions. It was agreed to collect five distress types, each with three severity levels. In evaluating the distress types for asphalt concrete pavements, it was determined that alligator cracking, patching, longitudinal cracking, transverse cracking, and raveling would be used. Raveling was selected because many local agencies base their sealing programs on the amount of raveling on any given segment.

As a carryover from the first attempt at a simplified system, a separate sheet was included—a look-up table—on which the city could find the deduct values for each of the five distress types and three severity levels. A look-up table was also created to use a corrected deduct matrix on segments that had multiple occurrences of distress. The resulting corrected deduct value would then be subtracted from 100 to arrive at a PCR.

Under this modified simplified system, a city would survey its streets using the form set forth in Figure 1. This form included a space for inventory items, a distress survey, the total distress found on a given segment, the resultant deduct values associated with the distress, a box for the total deducts, a box for the corrected deduct value, and the resulting PCR.

For a city to implement this modified "simplified system," it would have to follow these steps on each segment of its network:

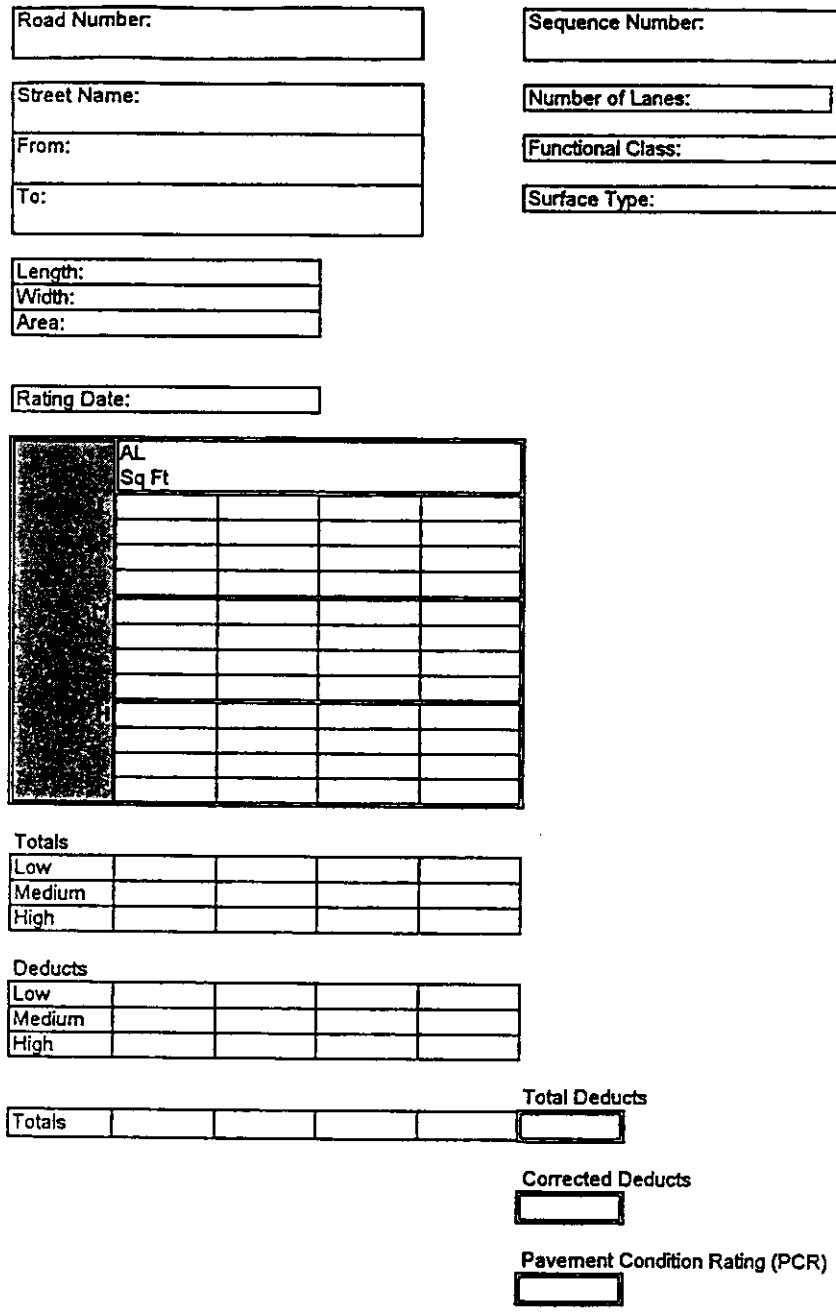

FIGURE 1 Survey form for simplified system.

1. Gather the necessary inventory data,
2. Conduct the pavement condition evaluation,
3. Total the distress types and severity levels,
4. Find deducts for each distress type and severity level,
5. Total the deducts,
6. Total the number of deduct values greater than 5 or q-value,
7. Use look-up table to apply q-value against a corrected deduct total,
8. Subtract corrected deduct total from 100, and
9. Arrive at PCR.

However, this procedure also proved to be cumbersome and needed fine-tuning. No smaller city could afford the time to follow these steps, let alone create a pavement maintenance budget or prioritization list from the results. Although this attempt was closer to the procedures that other cities in the state were following, it was much too complicated to be called simple.

THIRD TRY AT SIMPLIFIED SYSTEM

The first area that WSDOT modified in its third attempt to develop a simplified system was the distress survey. Though precision was important, percentage ranges of distress within a segment were substituted for exact measurements. The ranges are as follows: 0 to 1 percent, 1 to 5 percent, 5 to 10 percent, 10 to 25 percent, and

greater than 25 percent. These ranges were chosen because some cities in Washington use them in their condition survey collection. The percentage ranges were kept, even though the cities modified them to incorporate a more detailed pavement condition survey. The cities would continue to perform a detailed survey based on the procedures in the *Pavement Surface Condition Evaluation Manual*.

For example, in a 930-m^2 (10,000-ft^2) segment, which has a width of 6.1 m (20 ft) and a length of 152.5 m (500 ft), the following distress was found: 186 m^2 (2,000 ft^2) of low-severity raveling and 91.5 wheelpath-m (300 wheelpath-ft) of low-severity alligator cracking. For alligator cracking, the city would take the wheelpath meters collected and divide by the total wheelpath meters (wheelpath feet) in the segment to arrive at a percentage range. In this example, the calculation would be as follows:

91.5 wheelpath-m (300 wheelpath-ft)/610 wheelpath-m (2,000 wheelpath-ft) · [4 lanes × 152.5 m (500 ft)] = 15% low-severity alligator cracking

Therefore, the city would place this figure in the range of 10 to 25 percent.

For raveling, a city would divide the total area of distress by the total area of the segment surveyed. In this example, the calculation would be as follows:

186 m^2 (2,000 ft^2)/930 m^2 (10,000 ft^2) = 20% low-severity raveling

Therefore, the city would place this figure in the range of 10 to 25 percent.This process achieved the precision the cities desired, yet gave it a simplicity that they were able to implement easily.

WSDOT determined that instead of having all of the distress information contribute to the overall PCR, the most predominant percentage range of alligator cracking and the most predominant percentage range and severity type of one additional distress type should be used. Though all of the distress types would continue to be collected, only two distress types and resultant severity levels would determine the overall PCR, therefore giving the smaller cities fairly accurate counts of the different distresses.

Using percentage ranges initially posed a problem for developing deduct values for the different distress types and severity levels. Since some accuracy had been compromised by using percentage ranges, it was not clear how much more the procedures could be simplified without rendering the procedure meaningless. A solution was found by taking the midpoints of the percentage ranges for the deduct curves used in the WSPMS. For instance, if a distress was found to be in the 1 to 5 percent range, the deduct used would be the one normally associated with 3 percent. This holds true for all percentage ranges for each distress type and severity level. Since the WSPMS does not have deduct values for raveling, a set of deduct values was established by using the Metropolitan Transportation Commission's PMS as a guide (*6*).

Determining the PCR by two distresses also helped make the corrected deduct step much easier. Instead of developing relationships between more than two distresses and having to total the number of distress types and severities that have deduct values greater than 5, look-up tables just need to be developed for alligator cracking, its three severity levels, and the other predominant distress type and severity level. An agency would then subtract this corrected number from 100 to arrive at the PCR. A more advanced version of this type of look-up table is found in Table 2.

After some discussion and analysis, the entire deduct step was simplified even further. A city would continue to collect the distress data and identify the predominant alligator cracking and other distress types, but instead of having to look up the deduct values after totaling the number of distresses, this step was built into the system. For instance, after a city has selected its two distress types and percentage ranges, it will be directed to a look-up table that reflects the PCR. The look-up table inverts the corrected deduct values and does the subtraction for the local agency. Figure 2 is the form developed to implement this procedure. Table 2 is the look-up table for high-severity alligator cracking developed to implement this procedure.

Instead of the nine steps given before, there were now only the following five steps:

1. Gather the necessary inventory data,
2. Conduct the pavement condition evaluation,
3. Total the distress types and severity levels,
4. Select predominant alligator cracking percentage range and other predominant distress, and
5. Look up the PCR on the table.

An example of how to calculate a PCR using the simplified system is set forth at the end of this paper.

As WSDOT was developing the procedure, it was important that the PCR scores could be compared with those of the other systems in the state. WSDOT performed an analysis that showed that between the PCR ranges of 100 and 40, the simplified system was ±3 PCR points from the other systems. Below 40, the simplified system deteriorated at the same rate as did other systems used by cities and counties, but it fell at a slower rate than the system that is employed by the state. This proves acceptable because local agency roadways in Washington normally deteriorate more slowly than those of the state's roadways at this point of the deterioration curve.

OTHER ADDITIONS TO SIMPLIFIED SYSTEM

Although it was not required for smaller cities, the form includes space to begin determining treatments and costs. Using a simple grouping process, a city would circle one of the four groups that contain the PCR for that segment. The PCR groupings for possible treatment selection are as follows: 100 through 75, 74 through 50, 49 through 25, and less than 25.

The city would then place a likely treatment next to each of the four groupings. If the city is unfamiliar with treatments for each of the groups, the form that is distributed with the program identifies a common treatment that other local agencies in the state use for PCRs in that group. After identifying an appropriate treatment, a city would estimate the cost to fix the segment; this cost would be derived from projects that the city had completed in the previous year. For instance, if the city knew the cost per square meter for an overlay project, it would use this number to arrive at a dollar figure to fix the street. Figure 3 is an example of this form.

Finally, an additional blank page is provided with the simplified system. This page, titled "Priorities for Street Maintenance," is to be used by the city to develop a prioritized listing of projects by segment.

Washington State Department of Transportation

StreetWise Pavement Condition Rating

Inventory Information

Road Number	Sequence No.	Functional Class
Street Name		
From	To	

Length (A)	x	No. of Lanes	X 2	=	Wheelpath Length (B)
		Width		=	Area (C)

Distress Information

Rating Date _____ Direction _____ Rater _____

		Alligator Cracking	Longitudinal Cracking	Transverse Cracks	Raveling	Patching
Low						
	Total					
Medium						
	Total					
High						
	Total					

PCR Calculations

	Percentages from "Distress Information"				
	(Total / Box (B)) 100	(Total / Box (A)) 100	(Total / Box (A)) 100	(Total / Box (C)) 100	(Total / Box (C)) 100
Low					
Medium					
High					

	Severity Summary (X One)			Extent Summary (X One)				
	Low	Med.	High	0 - 1%	1% - 5%	5% - 10%	10% - 25%	Above 25%
Alligator Cr.	☐	☐	☐	☐	☐	☐	☐	☐
Other (_____)	☐	☐	☐	☐	☐	☐	☐	☐

Maintenance Strategy

Treatment Groups (X One)

Group 1 PCR Between 75 - 100	☐
Group 2 PCR Between 50 - 74	☐
Group 3 PCR Between 25 - 49	☐
Group 4 PCR Between 0 - 25	☐

Comments _____

PCR ➥ _____

Treatment for Segment ➥ _____

Estimated Cost to Repair ➥ _____

DOT Form 140-200 10/95

FIGURE 2 Form for calculating PCR.

TABLE 2 PCR Table for High-Severity Alligator Cracking

0% to 1% High Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	85	85	85	85	85	85	79	80	76	85	76	75
1% to 5%	79	81	85	79	73	76	75	72	62	69	67	64
5% to 10%	76	76	80	74	65	73	72	66	48	58	58	52
10% to 25%	68	73	78	69	57	65	68	56	32	49	48	41
Above 25%	65	73	74	60	48	65	57	43	20	49	35	30

1% to 5% High Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	69	69	69	69	69	69	64	65	61	69	61	60
1% to 5%	65	66	69	65	59	62	60	58	48	55	53	50
5% to 10%	60	62	65	59	51	57	58	52	32	46	44	39
10% to 25%	53	59	63	54	43	52	53	43	22	35	34	29
Above 25%	50	59	59	46	40	52	43	30	19	35	24	18

5% to 10% High Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	58	58	58	58	58	58	63	54	50	58	50	50
1% to 5%	53	55	58	53	48	51	50	47	38	44	42	40
5% to 10%	49	52	54	48	41	46	47	41	24	33	33	30
10% to 25%	43	48	52	43	33	41	43	32	15	27	26	20
Above 25%	40	48	48	35	30	41	33	22	10	27	16	12

10% to 25% High Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	50	50	50	50	50	50	45	47	43	50	43	42
1% to 5%	46	48	50	46	41	43	42	40	31	37	35	32
5% to 10%	42	44	47	41	33	39	40	33	19	28	28	24
10% to 25%	35	41	45	36	27	33	35	27	9	21	20	15
Above 25%	30	41	41	30	20	33	27	16	5	21	12	7

Above 25% High Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	41	41	41	41	41	41	36	37	33	41	33	32
1% to 5%	36	38	41	36	31	33	32	30	23	29	27	25
5% to 10%	32	34	37	31	25	30	30	26	12	20	20	18
10% to 25%	27	31	35	28	20	26	27	19	4	14	13	8
Above 25%	20	31	31	22	15	26	20	10	2	14	5	2

Washington State Department of Transportation

StreetWise Pavement Condition Rating

Inventory Information

Road Number	Sequence No.	Functional Class
600500	10	ARTERIAL

Street Name: ANDERSON ROAD

From: JOHNSON AVENUE To: ANDREWS STREET

Length (A)	x	No. of Lanes	X 2	=	Wheelpath Length 610 meters (B)
152.5 meters		Width 7.93 meters		=	Area 1209 meters (C)

Distress Information

Rating Date MARCH 96 Direction BOTH WAYS Rater JOHN SMITH

	Alligator Cracking	Longitudinal Cracking	Transverse Cracks	Raveling	Patching
Low	6.1 meters	18.3 meters		465 square meters	213.5 meters
	12.2 meters	42.7 meters			15.25 meters
	30.5 meters				
	Total 48.8 meters	61 meters		465 sq meters	228.75 meters
Medium	18.3 meters	61 meters			
	Total 18.3 meters	61 meters			
High					
	Total				

PCR Calculations

	Percentages from "Distress Information"				
	(Total / Box (B)) 100	(Total / Box (A)) 100	(Total / Box (A)) 100	(Total / Box (C)) 100	(Total / Box (C)) 100
Low	8 %	40 %		46 %	6 %
Medium	3 %	40 %			
High					

	Severity Summary (X One)			Extent Summary (X One)				
	Low	Med.	High	0 - 1%	1% - 5%	5% - 10%	10% - 25%	Above 25%
Alligator Cr.	☒	☐	☐	☐	☐	☒	☐	☐
Other (RAVELING)	☒	☐	☐	☐	☐	☐	☐	☒

Maintenance Strategy

Treatment Groups (X One)

Group 1 PCR Between 75 - 100	☐
Group 2 PCR Between 50 - 74	☒
Group 3 PCR Between 25 - 49	☐
Group 4 PCR Between 0 - 25	☐

Comments

PCR ➡ 69

Treatment for Segment ➡ 5.04 centimeter Overlay

Estimated Cost to Repair ➡ $ 5000.00

DOT Form 140-200 10/95

FIGURE 3 Filled-out form for calculating PCR.

STATUS OF SIMPLIFIED SYSTEM

The simplified system for smaller cities in Washington has been developed over the past year. The TransAid Service Center of WSDOT has been working with a number of agencies to refine the system. Five cities—Buckley, Burlington, Langley, Steilacoom, and Prosser—are at some stage of implementation. They have worked closely with WSDOT to modify the forms and develop the users' manual that accompanies the simplified system.

The users' manual was to be sent out with all of the necessary items to every city in Washington with a population of less than 22,500 by December 20, 1995. Ongoing assistance for the simplified system will be provided by the TransAid Service Center. After the distribution of the simplified system, the TransAid Service Center will conduct classes around the state on using the system.

EXAMPLE OF SIMPLIFIED SYSTEM OPERATION

In this example—which can be referred to in Figure 3 and Tables 2, 3, 4, and 5—a city has filled out the inventory form for a segment and has surveyed the street. The city totals alligator cracking by the different severity levels: there are 48.8 wheelpath-m (160 wheelpath-ft) of low-severity alligator cracking and 18.3 wheelpath-m (60 wheelpath-ft) of medium-severity alligator cracking. The low-severity alligator cracking is predominant and is circled.

The next step is to find the percentage range for the alligator cracking. Since there are two lanes on this street, there are four wheelpaths. The length of the segment is 152.5 m (500 ft), thus the total wheelpath length would be 610 m (2,000 ft). As there are 48.8 wheelpath-m (160 wheelpath-ft) of low-severity alligator cracking, this number is divided by 610 m (2,000 ft), which results in 8 percent. This number represents an alligator cracking range of 5 to 10 percent, which is placed in the box provided underneath the totals of the amount of distress collected on the form.

Next, the city must find the other predominant distress type. On this segment there is no distress greater than 465 m^2 (5,000 ft^2) of raveling, which is divided into the total area for the segment, or 1209 m^2 (13.000 ft^2). The result is 38 percent, which represents a raveling percentage range greater than 25 percent. This is the other distress and is placed in the box provided on the form.

Next, the city would locate the look-up table for low-severity alligator cracking. It is provided in Table 4. The city would find the correct percentage range table for the alligator cracking. In Table 4, it is the entry for the range of 5 to 10 percent under the column head "Low." With the other distress being raveling above 25 percent, the resulting PCR is 69. This straightforward procedure is repeated until all segments in the city have been completed.

TABLE 3 PCR Table for Individual Distresses

Alligator Cracking

	High	Medium	Low
0 to 1 %	79	86	93
1% to 5%	59	71	82
5% to 10%	43	58	72
10% to 25%	32	48	62
Above 25%	17	32	46

Longitudinal Cracking

	High	Medium	Low
0 to 1 %	89	100	100
1% to 5%	70	85	94
5% to 10%	48	74	87
10% to 25%	26	63	78
Above 25%	n/a	n/a	n/a

Patching

	High	Medium	Low
0 to 1 %	88	96	100
1% to 5%	73	84	94
5% to 10%	56	75	86
10% to 25%	38	62	79
Above 25%	20	42	67

Raveling

	High	Medium	Low
0 to 1 %	89	93	100
1% to 5%	77	88	100
5% to 10%	64	84	95
10% to 25%	49	78	92
Above 25%	30	63	86

Transverse Cracking

	High	Medium	Low
0 to 1 crack per 30.5 M	100	100	100
1 to 5 cracks per 30.5	80	90	96
6 to 10 cracks per30.5	64	83	91
10 to 25 cracks per 30.	51	75	85
Above 25 cracks per 30	51	75	85

CONCLUSIONS

By working with smaller cities, the TransAid Service Center of WSDOT has been able to develop a manual simplified system that is comparable to and compatible with the computerized systems used by the larger cities and counties in the state. The results of the simplified system can be used by metropolitan as well as regional transportation planning authorities in developing their individual TIPs. The information that each city collects using the simplified system can also be transferred to a computerized system, if a city ever chooses to upgrade. The implementation of the simplified system by all smaller cities with Federal-aid roadways will begin later this year. Even if Congress suspends ISTEA's management system mandate, WSDOT will encourage the smaller cities to implement the simplified system.

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TABLE 4 PCR Table for Low-Severity Alligator Cracking

0% to 1% Low Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	93	93	93	93	93	93	90	91	86	93	86	86
1% to 5%	90	91	93	90	84	87	86	83	72	79	77	75
5% to 10%	85	88	91	85	75	82	83	76	55	68	68	62
10% to 25%	79	84	89	79	67	76	78	66	42	59	57	50
Above 25%	70	84	85	70	60	76	67	52	35	59	44	38

1% to 5% Low Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	86	86	86	86	86	86	81	83	78	86	78	77
1% to 5%	82	84	86	82	75	79	77	75	64	71	69	66
5% to 10%	76	79	83	76	67	74	75	68	48	60	60	54
10% to 25%	70	75	80	71	59	68	70	59	34	51	50	42
Above 25%	65	75	76	62	50	68	59	45	25	51	37	31

5% to 10% Low Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	79	79	79	79	79	79	74	75	71	79	71	70
1% to 5%	76	76	78	75	68	71	70	67	57	64	62	59
5% to 10%	69	72	75	69	60	66	67	60	41	53	53	48
10% to 25%	62	68	73	63	52	60	62	52	29	44	43	35
Above 25%	55	68	69	55	45	60	52	38	23	44	31	26

10% to 25% Low Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	71	71	71	71	71	71	66	68	63	71	63	62
1% to 5%	67	69	71	67	60	64	62	60	50	57	55	52
5% to 10%	62	65	68	61	53	59	60	53	34	46	46	41
10% to 25%	56	60	66	56	45	53	55	45	24	38	36	30
Above 25%	50	60	61	48	35	53	45	32	15	38	26	20

Above 25% Low Severity Alligator Cracking

	Low				Medium				High			
Other Distress	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch	LC	TC	Ravel	Patch
0 to 1 %	60	60	60	60	60	60	55	56	52	60	52	52
1% to 5%	55	57	60	55	50	53	52	49	40	46	44	42
5% to 10%	51	53	56	50	42	48	49	43	26	35	35	30
10% to 25%	45	50	54	45	35	43	45	34	16	29	27	22
Above 25%	35	50	50	38	25	43	36	24	10	29	17	13

TABLE 5 PCR Table for Medium-Severity Alligator Cracking

0% to 1% Medium Severity Alligator Cracking

Other Distress	Low LC	Low TC	Low Ravel	Low Patch	Medium LC	Medium TC	Medium Ravel	Medium Patch	High LC	High TC	High Ravel	High Patch
0 to 1 %	90	90	90	90	90	90	85	86	81	90	81	80
1% to 5%	85	86	90	85	78	82	80	77	67	75	72	69
5% to 10%	79	83	86	79	70	76	77	71	50	62	62	57
10% to 25%	73	78	84	74	62	71	73	61	37	53	52	45
Above 25%	65	78	79	65	55	71	62	48	30	53	40	33

1% to 5% Medium Severity Alligator Cracking

Other Distress	Low LC	Low TC	Low Ravel	Low Patch	Medium LC	Medium TC	Medium Ravel	Medium Patch	High LC	High TC	High Ravel	High Patch
0 to 1 %	78	78	78	78	78	78	73	75	70	78	70	68
1% to 5%	74	75	78	74	67	71	69	64	56	63	61	59
5% to 10%	69	71	75	68	59	65	64	60	41	52	52	47
10% to 25%	62	67	72	62	52	60	62	51	29	43	42	35
Above 25%	55	67	68	54	45	60	52	38	25	43	30	25

5% to 10% Medium Severity Alligator Cracking

Other Distress	Low LC	Low TC	Low Ravel	Low Patch	Medium LC	Medium TC	Medium Ravel	Medium Patch	High LC	High TC	High Ravel	High Patch
0 to 1 %	69	69	69	69	69	69	63	65	60	69	60	60
1% to 5%	64	65	69	64	58	61	60	57	48	54	52	50
5% to 10%	59	62	65	59	50	56	57	51	32	43	43	38
10% to 25%	53	58	62	53	43	51	53	42	22	35	33	28
Above 25%	45	58	59	45	35	51	43	30	15	35	24	19

10% to 25% Medium Severity Alligator Cracking

Other Distress	Low LC	Low TC	Low Ravel	Low Patch	Medium LC	Medium TC	Medium Ravel	Medium Patch	High LC	High TC	High Ravel	High Patch
0 to 1 %	61	61	61	61	61	61	56	58	53	61	53	53
1% to 5%	57	59	61	57	51	54	53	50	41	48	45	43
5% to 10%	52	55	58	52	43	50	50	44	27	37	37	32
10% to 25%	46	51	55	47	36	44	46	35	16	30	29	23
Above 25%	40	51	52	39	30	44	36	25	10	30	19	14

Above 25% Medium Severity Alligator Cracking

Other Distress	Low LC	Low TC	Low Ravel	Low Patch	Medium LC	Medium TC	Medium Ravel	Medium Patch	High LC	High TC	High Ravel	High Patch
0 to 1 %	50	50	50	50	50	50	45	47	43	50	43	42
1% to 5%	46	48	50	46	41	43	42	40	31	37	35	32
5% to 10%	42	44	47	41	33	39	40	33	19	28	28	24
10% to 25%	35	41	45	36	27	33	35	27	9	21	20	15
Above 25%	30	41	41	30	20	33	27	18	5	21	12	7

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